

observing place, bounded by his horizon, appears to lie at the top of the earth, and therefore parallel to

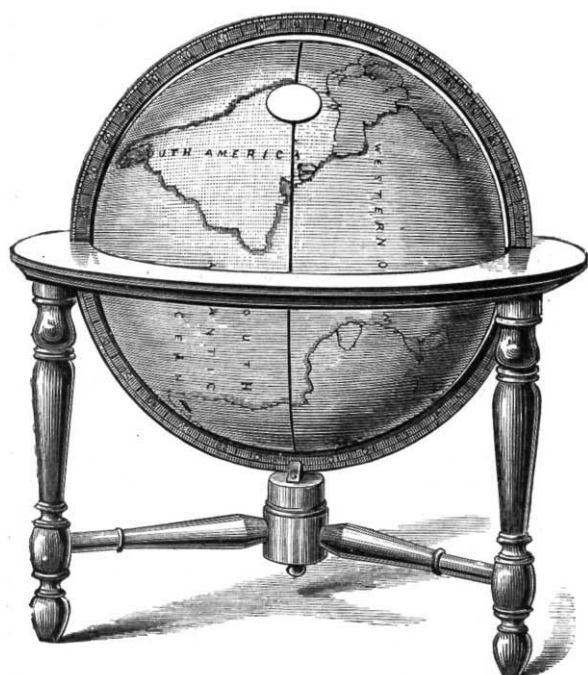


FIG. 5.—A model of the earth, showing that when the poles lie in the plane of the true horizon, and therefore of the wooden horizon which represents it, the horizon, represented by a wafer, of an observer situated on the equator, is carried vertically up and down by the earth's rotation; this motion reflected causes the apparent up-and-down motion of the stars as observed at the equator.



FIG. 6.—In this case the axis is inclined to the wooden horizon, which is parallel to the horizon of Britain when at the top of the globe. The wafer representing the horizon of Stonehenge is carried obliquely up and down in a direction parallel to the equator, so that the sun and stars rise obliquely to the horizon.

the wooden horizon; let us therefore use two wafers to represent local horizons, and place one on the equator and the second on Britain.

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When we bring the equatorial wafer to the top of the globe, where it lies parallel to the wooden horizon, we find that on rotating the globe it sweeps down in a vertical plane. The wafer over Britain, parallel to the wooden horizon when it is brought to the top of the globe, when the globe is rotated takes an *inclined* path to the horizon. This happens because the axis, instead of lying in the plane of the wooden horizon, is inclined to it. This inclination of the axis varies with the latitude of the place, and so the angle of inclination of the path of the wafer to the wooden horizon varies with the latitude. If we so arrange our model earth that the inclination of the axis is the greatest possible and the earth's equatorial plane lies in the plane of the wooden horizon, it is obvious that the earth's movement will only cause a wafer at the pole to rotate; with this exception it will remain at rest, and as there is no vertical motion to reflect, the stars will neither rise nor set.

Now the value of these little experiments depends upon the already stated fact that the *apparent* movements of the heavenly bodies are brought about by the real movements of the earth, and the experiments show us that in regard to the horizon at any place the *true* movement of the underlying earth, and therefore the *apparent* movement of the overlying heavens, is vastly different.

At the equator an observer's horizon is being whirled round in a vertical plane at the rate of 1000 miles an hour; at the poles the horizon remains parallel to itself. In Britain we have a midway condition. Correspondingly with these differences, at the equator we have stars rising and setting vertically and rapidly; in Britain stars rising and setting obliquely and more slowly; at the poles the stars neither rise nor set.

We may now return for a moment to Fig. 4, which we have so far considered in relation to the sphere of observation. It really enables us to study as well the conditions of the celestial sphere for the horizon N. E. S. W. of, let us say, Stonehenge in lat. 51° N. P represents the position of the celestial pole, and egw the inclination to the horizon of the celestial equator for that latitude. The lines eg and asm give the angle of slant as the sun or a star on the equator or in a northern declination rises above the horizon.

Two or three technical terms which will be often used afterwards may here again be referred to. pn gives the height of the celestial pole, which is the same as the latitude of the place, zp its *zenith distance*; it will be seen that these are complementary to each other, that is, together they make up 90° . s representing a star or the sun, ps is its *polar distance*, as ks is its *declination* or distance from the equator; it is seen that these again are complementary to each other. The line sz represents its *zenith distance*.

NORMAN LOCKYER.

INTERNATIONAL CONGRESS ON TUBERCULOSIS AT WASHINGTON.

THE International Congress on Tuberculosis to be held in Washington between September 21 and October 12 promises to be one of the most interesting and important in the history of these meetings. Presided over by the President of the United States, assisted by Dr. Edward L. Trudeau, acting as honorary president, Dr. John S. Fulton, secretary-general, Mr. Henry Phipps, of New York, as treasurer, an exceedingly strong national committee has been brought together, and very complete arrange-

ments have been made for the exhibition of interesting plans and specimens, and for a full discussion of some of the more interesting questions and problems, medical and social, bearing upon the treatment and prevention of tuberculosis.

Great Britain, acting through an executive committee selected from a very large representative national general committee, and presided over by Sir William Church, with Dr. Theodore Acland as treasurer and Dr. J. J. Perkins as secretary, has for some time past been engaged in preparing a series of reports on the methods of combating the spread of tuberculosis and in carrying out treatment of this disease, which reports will be presented by national and other delegates.

When the executive committee was first formed the whole of the members met in London; but as soon as the general plan of work had been laid down it was decided that national committees in England, Scotland, and Ireland should meet in London, Edinburgh and Dublin, the Dublin committee being presided over by Her Excellency the Countess of Aberdeen. These committees have made the arrangements for the report from each country to be presented to the congress. They have also combined to send out an "exhibit" of plans, sections, pathological specimens, and other preparations for the large museum which has been arranged by the American Exhibition Committee working under Dr. Henry Beyer, of Washington. The keenest interest is being taken in the work of the congress, and President Roosevelt, in accepting the presidency, speaks of the modern crusade against tuberculosis as bringing "hope and bright prospects of recovery to hundreds and thousands of victims of the disease, who under old teachings were abandoned to despair. The work of this congress will bring the results of the latest studies and investigations before the profession at large, and place in the hands of our physicians all the newest and most approved methods of treating the disease—a knowledge which will add many years of valuable life to our people, and will thereby increase our public wealth and happiness. . . . Our country, which is honoured this year as the host of other nations in this great gathering of leaders and experts, and as the custodian of the magnificent exhibit which will be set up by the entire world, should manifest its appreciation by giving the congress a setting worthy of the cause, of our guests, and of ourselves. We should endeavour to make it the greatest and most fruitful congress which has yet been held, and I assure you of my interest and services to that end." Should this spirit pervade, as no doubt it does, the whole of the American executive, we may be assured of the fruitfulness of the congress.

From Great Britain Government delegates are being sent out in the interests of the various local government boards, and it is to be hoped, in view of proposed legislation on tuberculosis, that as full a report as possible of the work of the congress may be placed in the hands of those whose duty it will be to draw up legislation to be placed before the Parliament of the country. The universities, various medical schools and examining bodies, the Royal Commission on Tuberculosis, the Royal Society of Medicine, municipalities, the Victoria Jubilee Institute for Nurses, King Edward VII. Sanatorium, the National Association for the Prevention of Consumption, Invalid Children's Association, and other institutions are sending out representatives to assist in the discussion of such questions as the portals of entry, sources and channels of infection, especially the path of the tubercle bacillus from the exterior to the lungs, vital importance of early diagnosis, comparative importance of

treatment in sanatoria near at hand, of entire change of climate, the present status of sanatoria treatment, diet in pulmonary tuberculosis, graduated labour in the treatment of tuberculosis, urgent necessity for hospitals for far advanced cases, relative frequency by bovine infection of lung disease compared with that of other organs, the economical aspect of tuberculosis, adverse industrial conditions, the social control of tuberculosis, after care of arrested cases, educational methods and agencies, promotion of immunity, responsibility of society for tuberculosis, &c.

One of the most interesting sections is that dealing with State and municipal control of tuberculosis, in which the provisional programme includes laws and ordinances relating to tuberculosis, especially with reference to notification, Government care of tuberculous patients, educational propaganda and scientific research under Government auspices, sanitary measures in the home, including disinfection, better housing, ventilation, &c., sanitary surveillance over travellers and those engaged in trades and occupations, in public buildings, factories and workshops, &c., prevention of tuberculosis among children and adolescents, including the subjects of heredity, environment, schools, factories, playgrounds, &c. In the section dealing with tuberculosis in animals and its relation to man, the prevalence of the disease amongst domestic animals, the modes of infection and the methods of diagnosis are all to be dealt with in a series of interesting papers, as are also resistance to tuberculosis in different genera, species, breeds, families and individuals, the methods for controlling the disease in animals, the comparative bacteriology and pathology of tuberculosis in animals, the relation of tuberculosis in animals to the public health, including the evidence for and against the transmission of tuberculosis from animals to man, milk hygiene and meat hygiene in relation to tuberculosis in animals. These papers should lead to most enlightening discussions, and we may confidently look forward to some very interesting and important reports.

THE LATE M. MASCART.

THE ranks of French physicists have suffered sad losses of late. Last week it was Henri Becquerel whose obituary we published. To-day it is that of M. Mascart, whose death occurred on August 26 at his country residence at Poissy, where he had lain suffering for some months.

Éleuthère Élie Nicolas Mascart was born at Quarouble, near Valenciennes, on February 20, 1837. He was a scholar of the *Ecole normale supérieure*, taking his first degree in science in 1858, was admitted *agrégé* in 1861, and *docteur-ès-sciences* in 1864. His first post was that of conservator of the collections in the *École normale*. Then he became professor of physics in the *Lycée de Versailles*, and subsequently at the *Collège Chaptal*. He also acted as deputy for Regnault at the *Collège de France* during the later years of that great master; and in 1872 succeeded to the occupancy of his chair. Devoted to experimental physics, and, like his master, possessed of a great capacity for the methodical and patient treatment of details, he early made his mark in the scientific study of meteorology. It was therefore an appropriate appointment when in May, 1878, he was elected to the post of director of the Central Bureau of Meteorology in Paris. This post he filled for nearly thirty years, retiring only in 1907. He succeeded in the face of numerous difficulties in gradually perfecting the equipment and organisation of his bureau, and in establishing the systematic publication in France of weather-charts and weather-forecasts.